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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/540,776 | 06/24/2005 | Susumu Noda | 123610 | 6701 |
| 25944 | 7590 | 06/27/2006 | EXAMINER | |
| OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320 | | | EL SHAMMAA, MARY A | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2883 | |

DATE MAILED: 06/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | | |
|------------------------------|------------------------|--|---------------------|--|
| Office Action Summary | Application No. | | Applicant(s) | |
| | 10/540,776 | | NODA ET AL. | |
| | Examiner | | Art Unit | |
| | Mary A. El-Shammaa | | 2883 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 6-11 and 15-22 is/are rejected.
- 7) ☒ Claim(s) 12-14 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>6/05</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 6, 10, 15-19, and 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Villeneuve et al. (US 6,130,969 herein after referred to as '969).

Regarding claims 6 and 15-18, '969 discloses in the figures an electromagnetic wave frequency filter, comprising: a) a two-dimensional photonic crystal (300) having a slab-shaped body provided with a plurality of modified refractive index areas having a refractive index different from that of the body, which are periodically arranged in the body; b) an input waveguide (304); c) an output waveguide (306), which is positioned so that its distance from the input waveguide at a predetermined section along its length is shorter than its distance at another section; and d) a resonator (307) consisting of a point-like defect that resonates with an electromagnetic wave having a predetermined frequency, which is located within the predetermined section between the input waveguide and the output waveguide (See Abstract; col. 1, line 60 through col. 2, line 35; col. 3, line 45 through col. 4, line 67; col. 7, line 15 through col. 8, line 58). The Examiner notes that the claim limitation "formed by creating a linear defect of the modified refractive index areas" is drawn to a process of manufacturing, which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be

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distinguished over the prior art by a process limitation. Consequently, absent a showing of an unobvious difference between the claimed product and the prior art, the subject product-by-process claim limitation has been considered, but not patentably distinct over '969 (see MPEP 2113).

Regarding claim 10, '969 discloses an electromagnetic wave frequency filter, comprising:

- a) a two-dimensional photonic crystal (300) having an in-plane heterostructure, which includes: a slab-shaped body provided with two or more forbidden band regions; and a plurality of modified refractive index areas having a refractive index different from that of the body, which are periodically arranged within each of the forbidden band regions with a cycle that is differently determined for each of the forbidden band regions;
- b) an input waveguide (304) passing through all the forbidden band regions;
- c) an output waveguide (306), which is positioned so that its distance from the input waveguide at a predetermined section along its length is shorter than its distance at another section; and
- d) a resonator (307) consisting of a point-like defect that resonates with an electromagnetic wave having a predetermined frequency, which is located between the input waveguide and the output waveguide within the predetermined section (See Abstract; col. 1, line 60 through col. 2, line 35; col. 3, line 45 through col. 4, line 67; col. 7, line 15 through col. 8, line 58; col. 11, lines 39-56; col. 12, lines 56-65). The Examiner notes that the claim limitation "formed by creating a linear defect of the modified refractive index areas within each of the forbidden band regions" is drawn to a process of manufacturing, which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent a showing of an unobvious

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difference between the claimed product and the prior art, the subject product-by-process claim limitation has been considered, but not patentably distinct over '969 (see MPEP 2113).

Regarding claims 19 and 21-22, '969 discloses the output waveguide being provided with a reflector for reflecting the electromagnetic wave having frequency equal to the resonant frequency of the resonator, and the distance between the resonator and the reflector is determined so that a phase distance between the electromagnetic wave introduced from the resonator into the output waveguide and the electromagnetic wave reflected by the reflector is zero (col. 9, lines 19-60).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7-9, 11, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over '969.

Regarding claims 7 and 11, '969 discloses the claimed invention except for the point-like defect being a donor type point-like defect. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the point-like defect being a donor type point-like defect, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use. In re Leshin, 125 USPQ 416. The motivation to use a donor type point-like defect is so as to increase the

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transmission of the resonator. The Examiner notes that the claim limitation “formed by creating a defect of the modified refractive index areas” is drawn to a process of manufacturing, which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent a showing of an unobvious difference between the claimed product and the prior art, the subject product-by-process claim limitation has been considered, but not patentably distinct over ‘969 (see MPEP 2113).

Regarding claims 8 and 9, ‘969 discloses multiple resonators, each of which is located within a predetermined section between the input waveguide and the output waveguide and resonates with an electromagnetic wave having a predetermined frequency, wherein each of the resonators corresponding to each of the output waveguides has a different resonant frequency (col. 3, lines 48-54). ‘969 does not disclose multiple output waveguides. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have multiple output waveguides, since it has been held that a mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8. The motivation to include multiple output waveguides is to increase the output from the system.

Regarding claim 20, ‘969 discloses the claimed invention except a phase distance being π . It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a phase distance being π , since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Allowable Subject Matter

Claims 12-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary A. El-Shammaa whose telephone number is 571.272.2469. The examiner can normally be reached on M-F (8:30am-5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571.272.2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MAE
June 18, 2006

Frank G. Font
Supervisory Patent Examiner
Technology Center 2800

